

WHAT IS CLAIMED IS:

1. A method of constructing queries selectively capable of returning aggregation information related to data in a database, comprising:
 - receiving user input specifying at least one result criterion for an abstract query comprising one or more logical fields, each corresponding to a logical field specification of a data abstraction model abstractly describing the data in the database, each result criterion corresponding to a logical field for which data is to be returned;
 - receiving user input specifying selection criteria for the abstract query;
 - receiving user input specifying an aggregation operation to be performed with respect to the at least one result criterion for generating aggregation information; and
 - associating the at least one result criterion with the aggregation operation in a manner allowing user selection of whether to perform the aggregation operation with respect to the at least one result criterion without requiring user-made changes to the abstract query.
2. The method of claim 1, further comprising:
 - transforming the abstract query into an executable query for execution against the data in the database.
3. The method of claim 2, wherein the executable query is an SQL query.
4. The method of claim 1, wherein the associating comprises:
 - generating a data object comprising the selection criteria, the at least one result criterion and the aggregation operation.
5. The method of claim 4, further comprising:
 - receiving a user selection to perform the aggregation operation with respect to the at least one result criterion;

determining, from the data object, the selection criterion, the at least one result criterion and the aggregation operation; and

generating an executable query on the basis of the determined selection criterion, the at least one result criterion and the aggregation operation, wherein the aggregation logic is applied to the at least one result criterion.

6. The method of claim 4, further comprising:

receiving a user selection not to perform the aggregation operation with respect to the at least one result criterion;

determining, from the data object, the selection criterion and the at least one result criterion; and

generating an executable query on the basis of the determined selection criterion and the at least one result criterion.

7. The method of claim 1, wherein the abstract query comprises at least a first and a second result criterion, the first result criterion being associated with the aggregation operation and the second result criterion being associated with a grouping operation to define a result group for the abstract query.

8. The method of claim 1, further comprising:

displaying a user interface allowing user selection of the selection criteria, the at least one result criterion and the aggregation operation.

9. The method of claim 8, wherein the displaying comprises:

displaying a selection element allowing the user selection of whether to perform the aggregation operation with respect to the at least one result criterion.

10. The method of claim 9, wherein the selection element is a checkbox.

11. A method of running queries selectively capable of returning aggregation information related to data in a database, comprising:

providing an abstract query comprising one or more logical fields, each corresponding to a logical field specification of a data abstraction model abstractly describing the data residing in the database, the one or more logical fields defining selection criteria, at least one result criterion and an aggregation operation to be performed with respect to the at least one result criterion, wherein the aggregation operation is associated with the at least one result criterion in a manner allowing user selection of whether to perform the aggregation operation with respect to the at least one result criterion without requiring user-made changes to the query;

receiving user input specifying that the aggregation operation is to be applied to the at least one result criterion of the abstract query;

after executing of a corresponding executable query, displaying results including aggregation information for the at least one result criterion;

receiving user input specifying that the aggregation operation is not to be applied to the at least one result criterion of the abstract query; and

after executing of a corresponding executable query, displaying results exclusive of aggregation information for the at least one result criterion.

12. The method of claim 11, further comprising:

generating a data object comprising the selection criteria, the at least one result criterion and the aggregation operation.

13. The method of claim 12, further comprising, after receiving the user input specifying that the aggregation operation is to be applied to the at least one result criterion:

determining, from the data object, the selection criterion, the at least one result criterion and the aggregation operation; and

generating the corresponding executable query on the basis of the determined selection criterion, the at least one result criterion and the aggregation operation, wherein the aggregation logic is applied to the at least one result criterion, the corresponding executable query being an SQL query.

14. The method of claim 12, further comprising, after receiving the user input specifying that the aggregation operation is not to be applied to the at least one result criterion:

determining, from the data object, the selection criterion and the at least one result criterion; and

generating the corresponding executable query on the basis of the determined selection criterion and the at least one result criterion, the corresponding executable query being an SQL query.

15. The method of claim 11, wherein the abstract query comprises at least a first and a second result criterion, the first result criterion being associated with the aggregation operation and the second result criterion being associated with a grouping operation to define a result group for the abstract query.

16. The method of claim 15, further comprising, after receiving the user input specifying that the aggregation operation is to be applied to the first result criterion:

generating the corresponding executable query in SQL, comprising:

creating a SELECT clause element in the SQL query for the first result criterion;

creating a SELECT clause element in the SQL query for the second result criterion; and

creating a GROUP BY clause element in the SQL query for the second result criterion.

17. A computer-readable medium containing a program which, when executed by a processor, performs a process of constructing queries selectively capable of returning aggregation information related to data in a database, the process comprising:

receiving user input specifying at least one result criterion for an abstract query comprising one or more logical fields, each corresponding to a logical field specification of a data abstraction model abstractly describing the data in the

database, each result criterion corresponding to a logical field for which data is to be returned;

receiving user input specifying selection criteria for the abstract query;

receiving user input specifying an aggregation operation to be performed with respect to the at least one result criterion for generating aggregation information; and

associating the at least one result criterion with the aggregation operation in a manner allowing user selection of whether to perform the aggregation operation with respect to the at least one result criterion without requiring user-made changes to the abstract query.

18. The computer-readable medium of claim 17, wherein the process further comprises:

transforming the abstract query into an executable query for execution against the data in the database.

19. The computer-readable medium of claim 18, wherein the executable query is an SQL query.

20. The computer-readable medium of claim 17, wherein the associating comprises:

generating a data object comprising the selection criteria, the at least one result criterion and the aggregation operation.

21. The computer-readable medium of claim 20, wherein the process further comprises:

receiving a user selection to perform the aggregation operation with respect to the at least one result criterion;

determining, from the data object, the selection criterion, the at least one result criterion and the aggregation operation; and

generating an executable query on the basis of the determined selection criterion, the at least one result criterion and the aggregation operation, wherein the aggregation logic is applied to the at least one result criterion.

22. The computer-readable medium of claim 20, wherein the process further comprises:

receiving a user selection not to perform the aggregation operation with respect to the at least one result criterion;

determining, from the data object, the selection criterion and the at least one result criterion; and

generating an executable query on the basis of the determined selection criterion and the at least one result criterion.

23. The computer-readable medium of claim 17, wherein the abstract query comprises at least a first and a second result criterion, the first result criterion being associated with the aggregation operation and the second result criterion being associated with a grouping operation to define a result group for the abstract query.

24. The computer-readable medium of claim 17, wherein the process further comprises:

displaying a user interface allowing user selection of the selection criteria, the at least one result criterion and the aggregation operation.

25. The computer-readable medium of claim 24, wherein the displaying comprises:

displaying a selection element allowing the user selection of whether to perform the aggregation operation with respect to the at least one result criterion.

26. The computer-readable medium of claim 25, wherein the selection element is a checkbox.

27. A computer-readable medium containing a program which, when executed by a processor, performs a process of running queries selectively capable of returning aggregation information related to data in a database, the process comprising:

retrieving an abstract query comprising one or more logical fields, each corresponding to a logical field specification of a data abstraction model abstractly describing the data residing in the database, the one or more logical fields defining selection criteria, at least one result criterion and an aggregation operation to be performed with respect to the at least one result criterion, wherein the aggregation operation is associated with the at least one result criterion in a manner allowing user selection of whether to perform the aggregation operation with respect to the at least one result criterion without requiring user-made changes to the query;

receiving user input specifying that the aggregation operation is to be applied to the at least one result criterion of the abstract query;

after executing of a corresponding executable query, displaying results including aggregation information for the at least one result criterion;

receiving user input specifying that the aggregation operation is not to be applied to the at least one result criterion of the abstract query; and

after executing of a corresponding executable query, displaying results exclusive of aggregation information for the at least one result criterion.

28. The computer-readable medium of claim 27, wherein the process further comprises:

generating a data object comprising the selection criteria, the at least one result criterion and the aggregation operation.

29. The computer-readable medium of claim 28, wherein the process further comprises, after receiving the user input specifying that the aggregation operation is to be applied to the at least one result criterion:

determining, from the data object, the selection criterion, the at least one result criterion and the aggregation operation; and

generating the corresponding executable query on the basis of the determined selection criterion, the at least one result criterion and the aggregation

operation, wherein the aggregation logic is applied to the at least one result criterion, the corresponding executable query being an SQL query.

30. The computer-readable medium of claim 28, wherein the process further comprises, after receiving the user input specifying that the aggregation operation is not to be applied to the at least one result criterion:

determining, from the data object, the selection criterion and the at least one result criterion; and

generating the corresponding executable query on the basis of the determined selection criterion and the at least one result criterion, the corresponding executable query being an SQL query.

31. The computer-readable medium of claim 27, wherein the abstract query comprises at least a first and a second result criterion, the first result criterion being associated with the aggregation operation and the second result criterion being associated with a grouping operation to define a result group for the abstract query.

32. The computer-readable medium of claim 31, wherein the process further comprises, after receiving the user input specifying that the aggregation operation is to be applied to the first result criterion:

generating the corresponding executable query in SQL, comprising:

creating a SELECT clause element in the SQL query for the first result criterion;

creating a SELECT clause element in the SQL query for the second result criterion; and

creating a GROUP BY clause element in the SQL query for the second result criterion.

33. A graphical user interface residing in memory, comprising:

a) a query conditions screen for specifying logical fields and operators to define abstract queries, the abstract queries being defined by a data abstraction model comprising metadata mapping the logical fields to physical data;

- b) an aggregation screen area, comprising:
 - a result field window displaying a plurality of result fields of a given abstract query, wherein the plurality of result fields are logical fields defined by the data abstraction model; and
 - a plurality of graphical selection elements for each of a plurality of selectable aggregation operations applicable to the result fields; and
- c) a grouping screen area displaying the plurality of result fields and wherein each selection of one of the plurality of result fields defines a result group for the given query;
- d) a first selection element for specifying whether the given query comprising user selections made from aggregation screen area and the grouping screen area will be executed as an aggregation query or a non-aggregation query, wherein the aggregation query returns summary information comprising each result group and values calculated by applying selected ones of the plurality of selectable aggregation operations to selected ones of the plurality of result fields; and
- e) a second selection element for initiating execution of the given query as the aggregation query or the non-aggregation query according to the selection made through the first selection element.

34. The graphical user interface of claim 33, wherein the first selection element is a checkbox.

35. The graphical user interface of claim 33, wherein the aggregation screen area comprises a selection window for displaying a query element comprising a selected result field and a selected aggregation operation applied to the selected result field by selection of a graphical selection element corresponding to the selected aggregation operation.